ANALYSIS, PRELIMINARY DETERMINATION AND DRAFT PERMIT FOR THE RENEWAL OF OPERATION PERMIT NUMBER 445031180-P01

AND

ANALYSIS, PRELIMINARY DETERMINATION AND DRAFT PERMIT FOR THE SIGNIFICANT REVISION OF PERMIT 99-SDD-109

FOR
THILMANY, LLC

LOCATED AT
600 THILMANY ROAD
KAUKAUNA, OUTAGAMIE COUNTY, WISCONSIN

Operation Permit Renewal No: 445031180-P10
Revised Construction Permit No: 99-SDD-109-R1
Facility FID No: 445031180

This review was performed by the Wisconsin Department of Natural Resources, Green Bay, in accordance with Chapter 285, Wis. Stats., and Chapters NR 400 to NR 499, Wis. Adm. Code. This review is for a Part 70 source located in an area which is designated attainment/unclassified for all criteria pollutants.

Reviewed by: James Crawford /s/ JGC Date: 1-29-2008

Peer review
conducted by: Carol Crawford /s/ CVC Date: 6-29-2007

Preliminary Determination Approved by:	**Signature**	**Date**
Regional Supervisor or Central Office Designee:	Rick Wulk /s/ RJW	1-29-2008
Stationary Source Modeling Team Leader:	John Roth /s/ JR	12-13-2007
Compliance Engineer (reviewed/approved):	James Crawford /s/ JGC	1-29-2008

cc: AM/7 - OP
Kaukauna Public Library, 111 Main Avenue, Kaukauna, WI 54130-0530

SECTION I. INTRODUCTION

Sources which are not exempt from the operation permit requirements under Section 407.03, Wis. Adm. Code, that were issued an operation permit from the Department of Natural Resources (WDNR) required to obtain a renewed air pollution control operation permit. Sources subject to the requirements must submit a permit renewal application to the Department by the date set forth in Sections 285.66(3)(a), Wis. Stats., and NR 407.04(2), Wis. Adm. Code. The renewal application is then reviewed following the provisions set forth in Sections 285.62, 285.63 and 285.64, Wis. Stats., and Chapter NR 407, Wis. Adm. Code.

Subject sources are to be reviewed for their air pollution control technology and for their impact upon the air quality. This is to insure compliance with all applicable rules and statutory requirements. The review will show why the source(s) operation should be approved, conditionally approved, or disapproved. It will encompass emission calculations and air quality analysis using U.S. EPA models, if applicable. Emissions from volatile organic compound (VOC) sources and small sources whose emissions are known to be insignificant are normally not modeled. As a precautionary note, the emission estimates may be based on U.S. EPA emission factors (AP-42) or theoretical data and can vary from actual stack test data.

This review is based on information contained within the renewal application submitted for an air pollution control operation permit. A renewed operation permit may be issued if the criteria set forth in sections 285.63 and 285.64, Wis. Stats., are met.

A WDNR decision on the renewal will not be made until the public has had an opportunity to comment on the Department's analysis, preliminary determination and draft permit. The conditions proposed in the draft permit may be revised in any final permit issued based on comments received or further evaluation by the Department.

Owner/Operator:	Thilmany, LLC 600 Thilmany Road Kaukauna, WI 54130-0600
Responsible Official:	Keith Morgan, Mill Manager (920) 766-8967
Permit Contact Person:	Thomas G. Jayne, Manager Environmental Services (920) 766-8656

Date of Administratively Complete Application: May 9, 2003

Dates of Submittal(s): August 26, 1999, May 9, 2003 (Title V renewal application for entire facility); October 6, 2004 (acetaldehyde update); May 13, 2005 (ownership change); August 16, 2004 (MACT II bubble limit for oil); November 11, 2005 (B9/B11 sub-bituminous coal request); December 15, 2005 (B07 heat input capacity); July 14, 2006 (modeling analysis); July 27, 2006 (MACT II bubble limit for natural gas); August 4, 2006 (CAM Plan); September 13, 2006 (boiler MACT HCBA eligibility); February 9, 2007 (comments on internal draft); March 29, 2007 (acetaldehyde); April 12, 2007 (acetaldehyde); May 22, 2007 (comments, HAP limits); August 23, 2007 (boiler B11); September 4, 2007 (boiler B07); December 21, 2007 (B11 compliance plan).

SECTION II. SOURCE DESCRIPTION

The facility consists of a kraft mill that manufactures unbleached pulp with kraft chemical recovery processes, paper machines, flexographic presses and coaters, boiler house and a wastewater treatment plant. Refer to the preliminary determination for Operation Permit #445031180-P01 for a complete description of the facility.

The original operation permit #445031180-P01 expires when operation permit #445031180-P10 (the renewal) is issued.

Concurrent with issuance of the renewal, the Department is revising construction permit 99-SDD-109 and issuing it as 99-SDD-109-R1. The revision lowers the emission limit for particulate matter by correcting an error in the emission limit for boiler B11.

The boilers are not subject to the requirements of the clean air interstate rule (CAIR), newly promulgated under ch. NR 432. WDNR is waiting for further information before determining which boilers, if any, are subject to the proposed Best Available Retrofit Technology (BART) rule.

The following processes were added since issuance of Operation Permit #445031180-P01 and are included in the renewal:

Table 1. Processes added to the facility

Stack and Process	Description
NCG (noncondensible gas) collection and incineration system, T83 NCG collection and incineration system T84 S39, P39	MACT I condensate collection and treatment equipment added in 2000. T83 and T84 are condensate tanks. P39 is the UNOX activated sludge biological treatment reactor.
S72, P72	No. 72 Flexographic Press
P33, B80, T33	No. 33 Wax Coater, 6.4 mmbtu/hour converting package boiler, 11,000 gallon wax storage tank, added in 2000.
S76, P76	No. 76 Flexographic Press, 4-color, added in 2000.

The following processes have ceased operation and are not included in the renewal:

Table 2. Processes no longer in operation

Stack and Process	Description
S28, P28	No. 27 Latex Coater removed in 2000.
S58, P58	No. 58 polyolefin extruder removed in 2003.
S77, P77	No. 77 Flexographic Press removed in 2003.
S74, P74	No. 74 Flexographic Press removed in 2005.
S34, P34	Cyrel #3040 plate maker removed in 2001 and replaced with Model 5280 plate maker and solvent still that were removed in 2006.

The pulp screening and cleaning system S21, P21 was previously considered a significant source. The facility requests it is treated as an insignificant source in the renewal.

The facility consists of the following significant emissions units:

Table 3. Significant Emissions Units

Stack and Process	Description	Capacity (for boilers), or Average Production Rate (for other processes) [1]	Installation/ Modification Date	Construction Permit?
S07, B07	Power Boiler fired on waste wood, paper and tire pellets	204 million BTU per hour (mmbtu/hour)	1963	None [2]
S09, B09	Power Boiler	192.4 mmbtu/hour	1957	None
S09, B11	Power Boiler	379.0 mmbtu/hour	1999	99-SDD-109-R1
S81, B81	Power Boiler	96.7 mmbtu/hour	1999	95-POY-098
S08/S10 B08	Recovery Boiler	206.3 mmbtu/hour	1953	None
S08/S10 B10	Recovery Boiler	321.7 mmbtu/hour	1961	None
S05, P08	No. 8 smelt dissolving tank	72,250 ton black liquor solids/year	1953	None
S06, P10	No. 10 smelt dissolving tank	136,000 ton blk. liquor solids/year	1961	None
S12, P12	Lime Kiln	125 ton lime/day	1986	86-SJK-024 86-SJK-024A 99-SDD-109-R1
S19, P19	Slaker	7.125 ton CaO feed/hour	1986	None; exempt
S17, P17	Digester System	600 air-dried ton pulp/day	1988	99-SDD-109-R1
S20, P20	A-Line and B-Line Brown Stock Washer Systems	600 air-dried ton pulp/day	1965	None
S22, P22	Unbleached Pulp Dewatering and Storage System	600 air-dried ton pulp/day	1984	None; exempt
S26, P26	Black liquor collection and storage system of 17 tanks	600 air-dried ton pulp/day	1991	None; exempt
S27, P27	Turpentine storage tank and transfer operation.	144,000 gallons turpentine/year	1991	None; exempt
S11, P11	No. 11 Paper Machine	5.0 tons per hour paper	1993	93-CTS-413
S13, P13	No. 13 Paper Machine	9.2 tons per hour paper	1987	None; exempt
S14, P14	No. 14 Paper Machine	5.6 tons per hour paper	1969	None
S15, P15	No. 15 Paper Machine	10 tons per hour paper	1994	None; exempt
S16, P16	No. 10 Paper Machine and No. 12 Paper Machine	11.3 tons per hour paper combined	1948 1957	None None
P33, B80, T33	No. 33 Wax Coater, boiler, and wax storage tank.	Off-line coater, 6.4 mmbth boiler, 11,000 gallon tank	2001	None; exempt
S50, P50	Red Hills Industrial Landfill	Passive Gas, Phase V start	1990	None; exempt
S52, P52	No. 52 Extruder	1 poly. extrusion laminator	1979	None
S55, P55	No. 55 Extruder	1 poly. 1-color flexo units	1993	None; exempt
S56, P56	No. 56 Extruder	2 poly. 1-color flexo/2 coaters	1973	None
S59, P59	No. 59 Tandem Extruder	2 poly. 1-color flexo/1 coater	1998	None; exempt
S72, P72	No. 72 Flexographic Press	10-color flexo units/1 coater	2003	03-MHR-010
S76, P76	No. 76 Flexographic Press	4-color flexo units/1 coater	2001	None; exempt
S39, P39	Wastewater Treatment	25.5 MGD	1976, 2000	99-SDD-109-R1
S49, P49	Mill-wide Haul Roads	13,844 VMT per year	1883	None
S45, P45	Log Storage, Chipping, Screening, Conveying	575,000 tons chips per year	1987	None; exempt

[1] Process production rates listed in this column are for informational purposes only and do not imply a limitation on production.

[2] Sources constructed prior to 1980 were not required to obtain construction permits.

Wastewater is treated in P39, an aerated lagoon S39, and UNOX reactor S91. The aerated lagoon treats pulp mill wastewater (except most foul condensate), landfill leachate, and storm water from paved mill areas. The UNOX reactor treats lagoon, primary clarifier effluent and hard-piped foul condensate required under the Pulp and Paper MACT I.

SECTION III. PART 70 STATUS

The facility is a Part 70 source because the potential to emit particulate matter, sulfur dioxide, total reduced sulfur (TRS), nitrogen oxides, volatile organic compounds and carbon monoxide is greater than 100 tons per year for each pollutant. The facility is also a major source of Federal HAPs because the potential to emit of several federal HAPs is greater than 10 tons per year.

Table 4. Potential to Emit Criteria and Hazardous Air Pollutants

Pollutant	Potential to Emit, tons per year	Source of Potential to Emit
Particulate Matter	1051	Renewal application, this review
Sulfur dioxide	9657	Original PD and Renewal application
Volatile Organic Compounds	617	Renewal application
Carbon Monoxide	1847	Renewal application
Nitrogen Oxides	3291	Renewal application, this review
Total reduced sulfur	138	Renewal application, this review
1,2 dichloroethane	0.08	Original PD and Renewal application
Acetaldehyde	11.8	Renewal application update 10/6/2004
Arsenic	0.034	Original PD and Renewal application
Benzene	0.8	Renewal application update 10/6/2004
Beryllium	0.002	Original PD and Renewal application
Cadmium	0.007	Original PD and Renewal application
Carbon Tetrachloride	0.32	Original PD and Renewal application
Chloroform	1.25	Original PD and Renewal application
Formaldehyde	2.51	Renewal application update 10/6/2004
Nickel	0.24	Original PD and Renewal application
Acrolein	1.53	Renewal application update 10/6/2004
Ammonia	124	Original PD and Renewal application
Antimony	0.006	Original PD and Renewal application
Barium	0.62	Original PD and Renewal application
Chromium	0.04	Original PD and Renewal application
Chromium hexavalent	0.013	Original PD and Renewal application
Cobalt	0.008	Original PD and Renewal application
Copper	0.016	Original PD and Renewal application
Hexachlorocyclopentadiene	0.019	Original PD and Renewal application
Hydrogen chloride	196	Original PD and Renewal application
Hydrogen fluoride	14.8	Renewal application update 10/6/2004
Hydrogen sulfide	62	Renewal application update 10/6/2004
Manganese	0.09	Original PD and Renewal application
Methanol	474	Renewal application update 10/6/2004
Selenium	0.10	Original PD and Renewal application
Thallium	0.0019	Original PD and Renewal application
Tin	0.02	Original PD and Renewal application

The emission estimates in Table 4. come from the facility's Title V renewal application, updates to the application and this review. It is presumed that these estimates are accurate. Facility-wide estimates (ton/year) for most pollutants decreased by 50 percent or more, due to more realistic calculation of the Potential to emit (PTEs) for boilers. The PTE of particulate matter (PM) decreased because of lower MACT limits for B08 and B10, and correction of the PM limits for B07 and B11. The PTE of sulfur dioxide stayed the same. The PTEs of hydrogen sulfide (H2S) and acetaldehyde increased.

The following tables detail the new emission estimates for particulate matter (PM), nitrogen oxides (NOx), and reduced sulfur compounds emissions (TRS and H2S).

Table 5. Facility Potential-to-Emit for Particulate Matter and Nitrous Oxides

Stack and Process	Description	Particulate Matter		Nitrogen Oxides	
		Lb/hr	tons/yr	Lb/hr	tons/yr
S07, B07	Power Boiler	61.2	268.06	60.73	266.00
S09, B09	Power Boiler	57.7	252.73	180.48	790.05
S09, B11	Power Boiler	37.9	166.00	355.52	1557.18
S08, S10, B08	Recovery Boiler	49.50	216.81	62.00	273.00
S08, S10, B10	Recovery Boiler	--	--	62.00	272.00
S05, P08	No.8 smelt dissolving tank	4.46	19.53	--	--
S06, P10	No.10 smelt dissolving tank	5.66	24.79	--	--
S12, P12	Lime Kiln	13.80	60.44	8.90	38.92
S19, P19	Slaker	0.34	1.49	--	--
S52	No. 52 Extruder	0.60	2.63	--	--
S55	No. 55 Extruder	0.75	3.28	1.10	4.82
S56A	No. 56 Extruder	0.41	1.80	0.55	2.41
S56B	No. 56 Extruder	0.41	1.80	0.55	2.41
S59A	No. 59 Tandem Extruder	0.50	2.19	0.70	3.07
S59B	No. 59 Tandem Extruder	0.50	2.19	0.70	3.07
S11	No. 11 Paper Machine	1.00	4.38	--	--
S13	No. 13 Paper Machine	1.00	4.38	0.30	1.31
S14	No. 14 Paper Machine	1.00	4.38	4.80	21.02
S15	No. 15 Paper Machine	1.00	4.38	0.30	1.31
S16	No. 10 & 12 Paper Machines	2.00	8.76	--	--
S81	Power Boiler	0.73	3.20	11.60	50.81
S72	No. 72 Flexographic Press	--	--	0.60	2.63
S76	No. 76 Flexographic Press	--	--	0.17	0.74
TOTAL		240.46	1051.25	751.00	3291.22

Emission estimates of hydrogen sulfide increased by 11 tons per year (from 51.58 tpy in 1999 to 62.21 tpy), when significant (new) amounts of H2S and TRS were measured in two stacks (S28, S29) at the pulp mill in 2003. Stacks S28 and S29 are located at the northeast and northwest corners of the roof of the brown stock washer building, respectively. S28 exhausts the A-line and B-line Brown Stock Washer foam breaker vents, B-line vacuum pump exhaust and miscellaneous pulp mill sewer. S29 exhausts the pulp mill sewer. Roughly 40 percent of the increased amounts are being removed in the UNOX tank (P39U). The PTEs in Table 6. reflect H2S and TRS removal by P39U.

Table 6. Calculation of Facility Potential-to-Emit for Hydrogen Sulfide and Total Reduced Sulfur with MACT I Clean Condensate Alternative

Stack and Process	Description	Hydrogen Sulfide		TRS	
		Lb/hr	tons/yr	Lb/hr	tons/yr
S08, S10, B08	Recovery Boiler	5.7	24.97	5.91	25.9
S08, S10, B10	Recovery Boiler	5.7	24.97	9.25	40.5
S05, P08	No.8 smelt dissolving tank	0.093	0.41	0.11	0.47
S06, P10	No.10 smelt dissolving tank	0.15	0.66	0.17	0.74
S12, P12	Lime Kiln	0.026	0.11	0.026	0.11
S19, P19	Slaker	0.018	0.08	1.12	4.91
S22, P22	Pulp Dewater/Storage	0.17	0.75	0.17	0.75
S26, P26	Black Liquor Tanks	0.32	1.36	1.8	7.8
S20, P20	Brown Stock Washers	0.013	0.06	0.082	0.36
S28, P20 [1]	Brown Stock Washers 24-inch fiberglass vent	0.24	1.04	3.13	13.71
S29, P17 [2]	Digester/Evap. Systems 16-inch pulp mill sewer vent	1.34	5.87	5.7	24.97
S91, P39U [3]	UNOX tank vent	0.0004	0.00	0.0153	0.07
S39, P39L	Wastewater lagoon	0.44	1.93	4.1	18.07
	TOTAL	14.21	62.21	82.88	138.36

Notes

1 MTE (maximum theoretical emissions) and PTE S28, P20 for H_2S: 0.0105 lb/oven dried ton of pulp (ODTP) x 22.523 ODTP/hr = 0.24 lb/hour

MTE and PTE S28, P20 for TRS: 0.139 lb/ODTP x 22.523 ODTP/hr = 3.13 lb/hour

To obtain lb/air-dried ton pulp divide lb/ODTP by 1.11, e.g. 0.139 lb/ODTP ÷ 1.11 = 0.125 lb/ADTP.

Actual emissions from S28: 0.182 lb H_2S/hr (11 parts per million dry volume (ppmdv), 2.39 lb TRS/hr (144 ppmdv), 5.56 lb methanol/hr.

All emission information from the stack test report, October 2003 (Weston).

2 MTE S29, P17 for H_2S: 0.09935 lb/ODTP x 22.523 ODTP/hr = 2.24 lb/hour

MTE S29, P17 for TRS: 1.8 lb/ODTP x 22.523 ODTP/hr = 40.54 lb/hour

Actual emissions from S29: 1.27 lb H_2S/hr (96 ppmvd), 22.8 lb TRS/hr (1,719 ppmvd), 2.03 lb methanol/hr.

Emission factors for the MTE are the average of Blow 2 run 1, and Blow 3 run 1, Weston tables 2-10, 2-12, 2-13. The MTE represents S29 when accumulator condensate is not sent to the UNOX reactor for the MACT Clean Condensate Alternative. Emissions are reduced from S29 (the PTE) when accumulator condensate is controlled by the UNOX reactor.

PTE S29, P17 for H_2S: 0.05967 lb/ODTP x 22.523 ODTP/hr = 1.34 lb/hour

PTE S29, P17 for TRS: 0.255 lb/ODTP x 22.523 ODTP/hr = 5.7 lb/hour

Actual emissions from S29: 0.98 lb H_2S/hr (74 ppmvd), 4.22 lb TRS/hr (317 ppmvd), 1.02 lb methanol/hr.

Emission factors for the PTE are the average of Blow 1 run 3, Blow 4 run 1 and Blow 5 run 3, Weston tables 2-10, 2-11, 2-14, 2-15.

3 UNOX Tank Vent S91, P39U

MTE and PTE S29U, P39U for H_2S: (2.24 – 1.34) x (1-0.99956) = 0.0004 lb/hour.

MTE and PTE S29U, P39U for TRS: (40.54 – 5.74) x (1-0.99956) = 0.0153 lb/hour.

SECTION IV. MACT STATUS

Emissions of hazardous air pollutants are regulated under section 112 of the Clean Air Act. Section 112 requires EPA to develop National Emission Standards for Hazardous Air Pollutants (also called MACT standards) for specific source categories. Most MACT standards apply only to major sources of HAPs. The facility is a major source of federal HAPs. MACT standard applicability is discussed in this section. Applicable standards are included in the renewal.

Subpart S: Kraft, sulfite, semi-chemical, and soda Pulping Processes: The facility is subject to this Pulp and Paper MACT I standard because it operates a Kraft pulping mill. MACT I is promulgated as a state rule under chapter NR 464, Wis. Adm. Code.

Subpart MM, Chemical Recovery Combustion: The recovery boilers B08 and B10, the smelt dissolving tanks P08 and P10, and lime kiln P12 are subject to this Pulp and Paper MACT II standard.

Subpart KK, Rotogravure and Wide-web Flexographic printing: The facility is a major HAP source that has wide-web flexographic printing operations. The MACT applies to inks and coatings applied to P55, P56, P59, P72 and P76. Since the facility applies less than 400 kilograms (882 pounds) per month of organic HAP on these sources, no other emission limitations, work practice standards or recordkeeping requirements apply.

Subpart JJJJ, Paper And Other Web Coating: This MACT applies to sources P33 and P52 only. Subpart JJJJ does not apply to sizing operations on paper machines or coatings applied under subpart KK.

Subpart DDDDD, Industrial, Commercial and Institutional Boilers and Process Heaters: The D.C. Circuit Court of Appeals vacated Subpart DDDDD on June 8, 2007. The future of this MACT standard is unclear and subject to change.

General Provisions: The pertinent general MACT provisions of chapter NR 460 are included in the renewal. The provisions require that the title V permit for an affected source shall require that the owner or operator adopt a startup, shutdown and malfunction (SSM) plan which conforms to the provisions of this chapter.

The renewal departs from s. NR 460.05(4)(c)2., in that it does not require that the owner or operator operate and maintain the source in accordance with the procedures specified in the current startup, shutdown and malfunction plan. This is because the Department intends to replace NR 460.05(4)(c)2 so as to conform with a change to the provision in EPA's final amendments to the General Provisions (effective April 20, 2006). The EPA change removes the requirement that the SSM plan must be followed during SSM periods. Instead a facility must show that it meets the requirements of the general duty clause [see NR 460.05(4)(a)1.] during SSM periods. The change is intended to give facilities the freedom to take the most appropriate and effective actions to minimize emissions, even if those actions differ from the SSM Plan.

Any revisions made to the startup, shutdown and malfunction plan in accordance with the procedures established by this chapter may not be deemed to constitute permit revisions under ch. NR 406 or 407. Moreover, none of the procedures specified by the startup, shutdown and malfunction plan for an affected source shall be deemed to fall within the permit shield provision in section 504(f) of the Act (42 USC 7661c(f)).

The following table summarizes MACT applicability for the significant processes at this facility.

Table 7. MACT Applicability

Stack and Process	Description	Subject to a MACT standard?	Applicable Limits
S07, B07	Power Boiler	Yes, subpart DDDDD Existing large solid fuel boilers. Existing means constructed before January 13, 2003. **This MACT standard was vacated 6/8/2007.**	None
S09, B09	Power Boiler	Yes, subpart DDDDD Existing large solid fuel boilers **MACT vacated.**	None
S09, B11	Power Boiler	Yes, subpart DDDDD Existing large solid fuel boilers **MACT vacated.**	None
S81, P81	Power Boiler	Yes, subpart DDDDD Existing large gaseous fuel boiler **MACT vacated.**	None
S08, S10 B08	Recovery Boiler	Yes, subpart MM Existing Chemical Recovery Sources	PM: 0.036 gr/dscf @ 8% oxygen bubble limit, or 0.044 gr/dscf @ 8% oxygen for limited use, i.e., < 6,300 hours per year.
S08, S10 B10	Recovery Boiler	Yes, subpart MM Existing Chemical Recovery Sources	PM: 0.036 gr/dscf @ 8% oxygen bubble limit, or 0.044 gr/dscf @ 8% oxygen for limited use.
S05, P08	No. 8 smelt dissolving tank	Yes, subpart MM Existing Chemical Recovery Sources	PM: 0.246 lb/dry ton of black liquor solids fired bubble limit, or 0.2 lb/dry ton of black liquor solids fired for limited use.
S06, P10	No. 10 smelt dissolving tank	Yes, subpart MM Existing Chemical Recovery Sources	PM: 0.246 lb/dry ton of black liquor solids fired bubble limit, or 0.2 lb/dry ton of black liquor solids fired for limited use.
S12, P12	Lime Kiln	Yes, subpart MM Existing Chemical Recovery Sources	PM: 0.13 gr/dscf @ 10% oxygen bubble limit on residual oil, 0.067 gr/dscf @ 10% oxygen bubble limit firing oil with natural gas or natural gas alone, 0.064 gr/dscf @ 8% oxygen for limited use.
S17, P17	Digester System	Yes, subpart S Pulp and Paper I Kraft Pulp Mills	Hazardous Air Pollutants (HAP): 1. Collect Low Volume, High Concentration (LVHC) gas and destroy in lime kiln P12 or boiler B11. 2. On and after April 17, 2006 collect 11.0 pounds HAP in condensate per oven dry ton pulp (ODP). 3. Destroy 92 percent of total HAPs in condensate or 10.1 lb HAP/ODP.
S20, P20	Brown Stock Washers	Yes, subpart S Pulp and Paper I Kraft Pulp Mills	

Stack and Process	Description	Subject to a MACT standard?	Applicable Limits
S22, P22	Pulp Dewater/Store	No, exempt due to low HAP emission rates.	No other requirements of Subpart S apply.
S11, P11	No. 11 Paper Machine	No, subparts DDDDD and JJJJ do not apply.	Combustion gases directly contact process materials according to the facility. Therefore the burners do not meet the MACT definition of a process heater. Coatings on size press are exempt.
S13, P13	No. 13 Paper Machine	No, subparts DDDDD and JJJJ do not apply.	Subparts DDDDD and JJJJ do not apply. Same reason as for P11.
S14, P14	No. 14 Paper Machine	No, subparts DDDDD and JJJJ do not apply.	Subparts DDDDD and JJJJ do not apply. Same reason as for P11
S15, P15	No. 15 Paper Machine	No, subparts DDDDD and JJJJ do not apply.	Subparts DDDDD and JJJJ do not apply. Same reason as for P11
S16, P16	Nos. 10 and 12 Paper Machines	No, subparts DDDDD and JJJJ do not apply.	Subparts DDDDD and JJJJ do not apply. Same reason as for P11
P33, B80, T33	No. 33 Wax Coater, boiler, storage tank.	Yes, subpart JJJJ Paper and Other Web Coating	Organic HAP: 4% of mass of coating materials applied/month, or 20% of the mass of coating solids applied/month.
S52, P52	No. 52 Extruder	Yes, subpart JJJJ Paper and Other Web Coating	Organic HAP: 4% of mass of coating materials applied/month, or 20% of the mass of coating solids applied/month.
S55, P55	No. 55 Extruder	Yes, subpart KK	Organic HAP: Apply no more than 882 lb/month on all subpart KK presses and keep records to demonstrate this.
S56, P56	No. 56 Extruder	Yes, subpart KK	Same as P55.
S59, P59	No. 59 Extruder	Yes, subpart KK	Same as P55.
S72, P72	No. 72 Flexo-graphic Press	Yes, subpart KK	Same as P55.
S76, P76	No. 76 Flexo-graphic Press	Yes, subpart KK	Same as P55.

SECTION V. SOURCE SPECIFIC APPLICABLE REQUIREMENTS

Numerous changes are made in the renewal to the applicable requirements for emissions units. Sources subject to the same standards are grouped in the same table. For example, stack requirements are listed together in a table at the back of the renewal. Changes are also made to correct errors, incorporate past permit requirements and add MACT requirements. Footnotes that clarify NR 445 conditions are moved into the BACT definitions in the permit tables. Applicable requirements for other processes that are added or changed are discussed in this section.

Table 2 shows new emissions units. Applicable requirements and emission calculations for new emissions units are contained in the two construction permits issued after the original operation permit, and are also not repeated here.

Many of the applicable requirements and emission calculations for the emissions units in Table 3 were reviewed under the preliminary determination for operation permit # 445031180-P01, and

remain essentially unchanged as a result of this renewal. Please refer to the preliminary determination for Permit #445031880-P01 for a detailed description of the applicable requirements and emission calculations for these emissions units.

A. POWER BOILERS B07, B09, B11 and B81

1. S07, B07: Waste Fuels Boiler

a. The renewal application states that B07 was installed and last modified in 1948 and has a maximum heat input rating of 122.6 mmbtu/hr. This review concludes that B07 was last modified in 1963 and has a heat input rating of 204 mmbtu/hr.

The company states the increase in boiler heat input capacity occurred in 1963, and that the higher capacity built into B07 is only now being reported. The increased capacity resulted from changes associated with the switch to bark and paper broke fuel.

The increase in heat input in 1963 increased the potential-to-emit of criteria emissions. It meets the definition of a modification under NR 400.02(99). Since the boiler was modified on or before April 1, 1972, a lower particulate matter emission limit does not apply. The 1963 modification pre-dated the construction permit program; therefore it does not trigger the need for a construction permit. The modification occurred before June 1, 1975, therefore PSD review does not apply. The modification took place before 1984, therefore the NSPS limits of NR 440.205 do not apply (boilers >100 mmbtu/hr).

b. Permit #86-SJK-072 establishes emission limits for particulate matter of 0.30 lb/mmbtu and 36.8 pounds per hour. The second limit was dropped when permit 445031180-P01 was issued. The first limit alone allows an increase in the maximum heat input rating of the boiler without new source review. Therefore the second limit is reinstated in the renewal. Based on the correction of the heat input capacity to 204 mmbtu/hr, the second limit is 61.2 pounds per hour.

c. An alternate anniversary date is established under condition O.2.a.(1) for biennial testing of B07 for particulate matter. The alternate date was requested by Carla Kramer in an email on 9/30/2005. The new anniversary date is September 27, 2007. The former anniversary date was May 10, 1999.

d. Permit 445031180-P01 allows control devices to not be used during *periods of normal start-up and shut-down as defined in the facility's start-up and shut-down procedures.* The emission limits under NR 415.06(1)(b) dictate that control devices are used during these times, if needed to ensure compliance. Therefore the renewal restricts operation without a control device to times when B07 is fired on natural gas only during a start-up. It is not presumed that the amount of particulate matter released during a shut-down will comply with the emission limits without control devices, because boiler soot may be entrained during a shutdown, even with a clean fuel like natural gas.

e. In a meeting held on September 29, 2005, the company made a request to delete the initials of the person performing the internal inspections of the control equipment. WDNR agrees with the request because records will still be adequate to demonstrate compliance.

f. In a meeting held on September 29, 2005, the company made a request to reduce the recordkeeping of multi-clone and scrubber operating parameters. It was requested that parameters are recorded at least 18 of 21 shifts per week. The company operates (3) 8-hour shifts. Permit 445031180-P01 requires that parameters are recorded once every eight hours whenever the boiler is operated. The change is not made, because NR 439.055(2)(b), requires that variables are monitored and recorded once for every 8 hours of source operation or once per day, whichever yields the greater number of measurements.

g. To demonstrate compliance with the particulate matter emission limit a stack test is required if TDF is burned in B07. The renewal restricts TDF combustion to 10 percent of total heat input (5 percent by weight) in B07 and a smaller amount if less is burned during the stack test.

Past tests indicate that most burn rates of TDF cause an exceedence of the particulate matter emission limits. Measured emissions are summarized in Table 8. It appears that no greater than 0.5 tph TDF and 10% heat input should be fed to the boiler, given the control efficiency of the existing wet scrubber. The units of heat input are retained to accommodate gaseous and liquid alternate fuels. The amount of TDF allowed is less than in former permits. Permit 86-SJK-072C allows up to 13% by weight TDF. Permit 445031180-P01 allows TDF to supply 31.73% of heat input.

Table 8. Particulate Emission Rate of Boiler B07 burning TDF with Paper Pellets and Wood Bark, Compared to Emission Limits of 0.3 Lb/MMbtu and 61.2 pounds per hour.

TDF burned Tons per hour	TDF Weight Fraction	Heat Input from TDF	PM Emitted Lb/mmbtu	PM Emitted Lb/hour
0.5 - note 1.	5 %	8.7 to 12.8 %	0.25	39.8
0.72 – note 2.	4.1 %	16 %	0.25	35.9
1.5 – note 2.	8.6 %	34 %	0.4	56.8

1. Data from a biennial stack test conducted in September 2005 (TDF, paper pellets, wood bark).
2. Data from informational tests (only 40-minute runs) conducted in January 2005.
3. Weight fractions with no test results are extrapolated (**).
4. Here is how the TDF firing rate of 0.5 tph is converted to percent heat input (9/2005 data):
 a. Total heat input to B07 using F-factor = 39.62 lb/hr ÷ 0.245 lb/mmbtu = 162 mmbtu/hr.
 b. Weight fraction of TDF = 3 percent = 100 x 0.5 tph TDF / (8.26 + 1.0 + 0.5) tph of fuels
 c. Total heat input to B07 using fuel estimates = 8.26 tph x 9.65 mmbtu/ton + 1.0 tph x 16.48 mmbtu/ton + 0.5 tph x 28.26 mmbtu/ton = (79.7 + 16.48 + 14.1) = 110.3 mmbtu/hour.
 d. TDF heat input = 100 x (14.1 / 162) = 8.7 % to 100 x (14.1 / 110.3) = 12.8 %

h. In a meeting held on September 29, 2005, the company made a request to change records on the amount of TDF burned from daily to monthly. WDNR disagrees with this change. In light of the high emission rates from TDF in B07, daily records are needed to document compliance with the PM emission limits.

i. Requirements are removed to conduct stack tests for mercury and dioxins when B07 burns TDF. A test at another facility (International Paper – DePere) demonstrates that there is not a significant increase of these pollutants from burning TDF.

j. The provision to burn Presto Products polyethylene alternate fuel is removed at the request

of the company.

k. To establish the maximum quantity of effluent treatment plant sludge (residual fibers) that can be burned in B07, the renewal requires a stack test to demonstrate that particulate matter emissions comply with the emission limit. The stack test must be conducted after June 2003, the date the nozzle was removed on the wet scrubber. Subsequent to a successful test, the renewal requires that the amount of sludge fire must be no greater than the amount fired in the stack test, and, the higher heating value of the sludge fired must be at least as great as that used in the stack test. The restrictions avoid an increase in moisture in the fuel mix and higher emissions of particulate matter.

2. S09, B09, B11: Boilers equipped with ESP C07

a. The correct date of the last modification of boiler B11 is 1999, as shown in Table 3. The boiler was modified by enlargement of the backup combustion system for non-condensable gases (NCG) to the boiler, according to an analysis in permit 99-SDD-109. The renewal application incorrectly states that B11 was last modified in 1967.

A larger supply of the NCG to B11 has the following implications:

- It is a modification as defined in NR 400.02(99). Since the boiler was modified after April 1, 1972, the appropriate emission limit is 0.10 pounds of particulate matter per mmBtu heat input per NR 415.06(2)(c). This emission limit should have been placed in permit 99-SDD-109 but was inadvertently omitted. To correct the limit the construction permit is revised concurrently with the renewal. The revision is made under the authority of NR 406.11(1)(c). The new limit replaces the existing limit of 0.3 pounds of particulate matter per mmBtu heat input.

- It is not a modification of B11 for purposes of NSPS, because the system's primary function is the reduction of NCG air pollutants. The exclusion from modification is allowed under NR 440.17(5)(e). Therefore B11 is not subject to the NSPS limits of NR 440.205.

The company proposes a compliance plan to study and install, for up to 3 years, improvements to the ESP control device. The proposed plan delays implementation of the 0.10 lb/MMBtu limit for 3 years. During this time the limit of 0.3 lb/MMBtu applies. The plan is approved in Section X.

b. At the request of the company, subbituminous coal is added as a primary fuel for B09 and B11. Since the emission factors are the same for bituminous and subbituminous coals, no emission increase is expected.

c. Requirements are removed to evaluate and keep records of the rapper settings for the electrostatic precipitator (ESP), because the ESP does not have rappers. A requirement is added to inspect the ESP hammer shafts, motors and drive mechanisms. These changes are based on a request from the company made August 26, 1999.

d. Permit 445031180-P01 requires inspection of the ESP controlling B09 and B11, and the B11 multi-clones, at a frequency not to exceed 18 months. In a meeting held on September 29, 2005, the company requested approval to conduct internal inspections at 26 month intervals. WDNR agrees with the request in principal. The renewal allows 26 months between inspections, but adds several requirements to ensure that inspections are effective and the control devices are functioning properly. The following requirements are added:

- to conduct the inspection of the ESP using the ESP vendor's Operation & Maintenance Procedure and Inspection Checklist, and to submit a report to the Department within 30 days of the inspection which contains the conclusions, recommendations and credentials of the inspector;
- to inspect the duct work leading from the boilers to the ESP;
- to conduct PM periodic compliance tests no closer than 6 months since the last inspection.

e. A requirement is added to keep daily records of the operation of each Transformer-Rectifier (TR) set in the ESP. The records will indicate the time and duration when any TR set is not operating. Stack tests of another ESP (Appleton Papers) show particulate emissions increase significantly as TR sets are turned off. Exhaust from boilers B09 and B11 is combined and controlled by a single ESP, C07. C07 was installed in 1976 by C-E Walther Inc, and has two TR sets [one chamber, 2 fields in series, 1 TR/field]. Subsequent to issuance of the renewal, if records show that C07 is operated without all TR sets operating for a significant duration, DNR will request a PM stack test with some TR sets off-line to measure the increase in PM.

f. Compliance demonstration requirements for boiler B11 for TRS contained in the August 3, 1994 EPA consent agreement are removed because the agreement expired on August 30, 2004, when the penalty was paid.

g. The provision to burn Presto Products polyethylene alternate fuel is removed at the request of the company.

h. Permit 445031180-P01 restricts the sulfur content of coal to 4.4 percent by weight, but does not place a limit on the sulfur content of other solid fuels which contain sulfur. B09 and B11 now burn a mixture of petroleum coke and coal. It is blended by the supplier before delivery. Petroleum coke has a higher sulfur content than coal. To ensure the mixture has a sulfur content no greater than 4.4 percent by weight, the renewal replaces the term 'coal' with 'coal blend'. A coal blend is defined as "any proportion of coal and petroleum coke."

The sulfur content limit of 4.4 percent was conceived in permit 86-SJK-72 when alternate sulfur dioxide emission limits were established under NR 417.07. Compliance demonstration methods for B09/B11 included the sulfur content limit and a sulfur dioxide CEM. At that time the boilers burned only coal (solid fuel).

i. Permit 445031180-P01 required a stack test for particulate matter while burning petroleum coke in combination with other fuels. The stack test for particulate matter was performed on 5/20/99 burning a mixture of 75% bituminous coal and 25% petroleum coke. PM emissions (0.127 lb/mmbtu) were well below the limit for B09 (0.30 lb/mmbtu). However, PM emissions exceeded the emissions limit of B11 (0.10 lb/mmbtu). Since the testing does not demonstrate compliance with 0.10 lb/mmbtu, the stack test requirement is retained in the renewal.

j. Recordkeeping for alternate fuels is consolidated in renewal table B.6. To ensure compliance with the PM emission limit, daily records are required for alternate fuels, except if they are burned during a successful stack test and subsequently burned at the opacity measured during the stack test. Then monthly records are allowed.

k. In a meeting held on September 29, 2005, and in comments dated February 9, 2007, the company made a request to change records from daily to monthly on the amount of TDF burned. WDNR agrees with this change as long as TDF is burned in the next scheduled successful biennial stack test (for particulate matter), and is subsequently burned at or below the opacity measured

during the stack test. Otherwise daily records are necessary to adequately document compliance with the B11 PM emission limit of 0.10 lb/mmbtu.

l. B11 burns small amounts of TDF. Requirements are removed to conduct stack tests for mercury and dioxins when B09 or B11 burn TDF. A test at another facility (International Paper – DePere) demonstrates that there is not a significant increase of these pollutants from burning TDF.

3. S81, B81: Natural Gas Fired Nebraska Package Boiler

The renewal application requests that hours of operation are expanded from 2400 hours per year to 6877 hours per year, based on a lower emission factor for NOx. The hourly restriction is part of construction permit 95-POY-098 to avoid PSD applicability. This request requires new source review and is not included in the renewal.

B. CHEMICAL RECOVERY UNITS

The facility proposed two sets of alternate MACT limits for particulate matter for the sources subject to Pulp and Paper MACT II (subpart MM). Alternate limits or bubble limits are allowed for existing sources by MACT II. The alternate limits apply to B08, B10, P08, P10 and P12. The proposed (bubble) limits are compared below with the MACT standard and stack test results.

Table 9. Particulate Emission Standards for MACT subpart MM Sources

	Recovery Boilers B08 and B10 (gr/dscf @ 8 % 0_2)	Smelt Dissolving Tanks P08 and P10 (lb/dry ton of black liquor solids fired)	Lime Kiln P12 (gr/dscf @ 10 % 0_2)
MACT standard	0.044	0.20	0.064
Proposed bubble limit when P12 burns residual oil.	**0.036**	**0.246**	**0.13** (residual oil)
Initial Performance Tests June 2004	0.0201	0.132	0.12 (residual oil)
Performance Test June 2006	--	--	0.067 (natural gas) 0.093 (natural gas) 3
Proposed bubble limit when P12 burns natural gas.	**0.036**	**0.246**	**0.067** (natural gas)

The alternate limits are no less stringent than the underlying NSPS limits for the lime kiln for residual oil and natural gas. Since this condition is met, the two sets of MACT II bubble limits (in bold) are incorporated into the renewal (for B08, B10, P08, P10 and P12). Each source with a bubble limit must operate more than 6300 hours per year.

The bubble limits differ by source only for the lime kiln, P12. The first set of bubble limits apply when the lime kiln (P12) is fired only on residual oil. The second set applies when the kiln is fired on residual oil and any amount of natural gas greater than a pilot flame.

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3 This emission rate resulted from an trial to expand the CMS range. After completion of the test runs, the CMS parameter set points were immediately returned to the values that demonstrated compliance.

1. S08, S10, B08, B10: Recovery Boilers

a. Boilers B08 and B10 are permitted to emit 0.3 lb/mmBtu of PM. Based on this limit and a combined heat input rating (528 million Btu per hour), they could emit 158.4 pounds PM per hour. A more restrictive PM emission rate is 49.5 lb/hr, derived from the MACT II limit of 0.044 grains of PM per dry standard cubic foot (gr/dscf) corrected to 8 percent oxygen. It was modeled and determined to protect air quality. Therefore the emission rate of 49.5 lb/hr is established in the renewal. Unlike the MACT II limit, the renewal limit includes both front and back-half particulate.

b. Boiler B10 was authorized by operating permits 86-SJK-072-R1 and 445031180-P01 to burn residual fuel oil. Since the physical capability to burn residual oil was never installed, the authorization is removed in the renewal. Installation of an oil burner in B10 may represent a modification to the boiler and require a construction permit, because oil emits more sulfur dioxide than kraft liquor (0.4 lb S02/gallon oil @ 2.5% S, versus 0.01 lb S02/gallon for kraft liquor).

c. A requirement is added to record when an ESP is not operated with all TR sets on, because testing of another ESP (Appleton Papers) shows particulate emissions increase significantly as TR sets are turned off. Exhaust from B08 and B10 is combined and split between two ESPs. If records show that C03 or C04 are operated without all TR sets operating for a significant duration, DNR will request a PM stack test with some TR sets off-line to measure the increase in PM.

Particulate matter emissions are controlled with electrostatic precipitators (ESPs) C03 and C04, in parallel. Each ESP has 1 chamber and 3 transformer-rectifier (TR) sets [3 fields in series, 1 TR/field]. The B-Side ESP is labeled C03 and exhausts to S08. The A-Side ESP is labeled C04 and exhausts to S10.

2. Smelt Dissolving Tanks

a. **S05, P08** The PM emission limit of 4.46 lb/hr is placed in the renewal. It was modeled and determined to protect air quality. The limit includes both front and back-half particulate. The applicable criteria PM emission rate comes from NR 415.04(1)(o), because P08 was last modified before 1972. NR 415.04(1)(o) allows an emission rate of 13.6 lb/hr, from [8,900 acfm x (.075 lb gas/ft^3 gas) x 0.4 lb/1000 lb gas x (68+460)/(162+460) x 60 min/hr]. This rate is not used, because a more restrictive PM emission rate of 4.46 lb/hr is derived from the MACT II bubble limit of 0.246 lb/ton black liquor solids (BLS).

b. **S06, P10** The PM emission limit of 5.66 lb/hr is placed in the renewal. It was modeled and determined to protect air quality. The limit includes both front and back-half particulate. The applicable criteria PM emission rate comes from NR 415.04(1)(o), because P10 was last modified before 1972. The equation allows an emission rate of 35.1 lb/hr, from [23,000 acfm x (.075 lb gas/ft^3 gas) x 0.4 lb/1000 lb gas x (68+460)/(163+460) x 60 min/hr]. This rate is not used, because a more restrictive PM emission rate of 5.66 lb/hr is derived from the MACT II bubble limit of 0.246 lb/ton BLS.

c. The renewal requires the company to install, calibrate, maintain, and operate a continuous parameter monitoring system (CPMS) to determine and record the pressure drop across the scrubber and the scrubbing liquid flow rate of these 2 scrubbers (which control P08 and P10 smelt dissolving tanks). The CPMS is an improved system which records a value every 15 minutes. Therefore the following scrubber monitoring requirements from permit 445031180-P01 are

removed: 1) to visually ensure scrubber liquid is free flowing once per shift, and 2) to record the pressure drop once every 8 hours. The allowed ranges for monitored values are also changed to reflect the CPMS.

3. S12, P12 Lime Kiln

a. An emission limit for particulate matter that includes back-half particulate is added in the renewal. The emission limit is 13.8 lb/hour. It was modeled and determined to protect air quality. The limit is derived from the NSPS and MACT II limits of 0.13 grains of PM per dry standard cubic foot (gr/dscf) corrected to 10 percent oxygen for burning liquid fossil fuel.

Criteria limits are compared below but are less restrictive than 13.8 lb/hour. Therefore they are not used. The applicable limit from s. NR 415.05 is the more restrictive of 0.2 lb/1000 lb exhaust gas (NR 415.05(1)(k) and the limit given by the process weight rate equation (NR 415.05(2)). NR 415.05(1)(k) provides a limit, E1 = 15.6 lb/hr = [20,000 acfm(.075 lb gas/ft^3 gas) x 0.2 lb/1000 lb gas x (68+460)/(150+ 460) x 60 min/hr]. NR 415.05(2) provides a limit, E2 = 15.5 lb/hr = $3.59(10.625 \text{ tph})^{0.62}$, where the process weight rate is 255 tons per day (tpd) lime mud (24 hour/day) and 135 tpd lime output.

b. The allowance to not operate wet scrubber C13 and control emissions of particulate matter during periods of normal startup and shutdown is removed. General provisions of NSPS require C13 to operate during startup and shutdown. The allowance is replaced with the NSPS requirement.

c. Stack test methods are spelled out since particulate matter emissions are measured differently to demonstrate compliance with each limit.

d. The requirement to list the initials of the person performing the inspection of the wet scrubber is removed at the request of the company.

e. The renewal requires the company to install, calibrate, maintain, and operate a continuous parameter monitoring system (CPMS) for MACT. The CPMS measures and records the scrubber liquid pressure and flow rate. The CPMS is an improved system which records a value every 15 minutes. Therefore the scrubber monitoring requirements in the particulate matter section of permit 445031180-P01 are replaced by the MACT requirements in the HAP section. The allowed ranges for monitored values are also changed to reflect the CPMS.

f. The application requests that biennial stack testing for sulfur dioxide is not included in the renewal, because the company performs periodic sampling of residual fuel oil. Newly created NR 439.075(4)(a)5. Wis. Adm. Code, removes the requirement for biennial testing when the fuel oil is sampled for sulfur in accordance with s. NR 439.085. Accordingly, biennial testing is removed from the renewal.

h. Limitations for nitrogen oxides found in permit 86-SJK-024A are restored because they were established in 1986 to avoid PSD review. These limits are 1.58 pounds per ton lime produced; and 8.90 pounds per hour. A provision was added to keep records based on a daily average.

On May 22, 2007, the company requested a revision to construction permit 86-SJK-024 which would change PSD avoidance limits, from 1.58 pounds per ton lime produced and 8.90 pounds per hour, to 6,500 pounds per 12-month rolling average. The requested revision is not made because it allows higher hourly emissions of nitrous oxides, even though it caps emissions at 39 tons per year. A construction permit is required to change the hourly limit.

i A requirement is added to keep daily records whenever natural gas or residual fuel oil are burned, because each fuel triggers a different particulate matter emission limit under NSPS, and these records are required by NSPS.

4. S19, P19 Slaker and Causticizing Tanks

a. The applicable criteria emission limit for particulate matter is derived from the more restrictive limit provided by code sections NR 415.05(1)(o) and 415.05(2), because the source was last modified after 1972. Using the equation of 415.05(2) provides an emission limit (E1) = 12.1 lb/hr = $3.59(7.125 \text{ tph})^{0.62}$. The emission limit calculated under 415.05(1)(o) provides E2 = 2.9 lb/hr = [2,000 acfm x (.075 lb gas/ft^3 gas) x 0.4 lb/1000 lb gas x (68+460)/(195+460) x 60 min/hr]. Thus this limit is 2.9 lb/hr (E2).

However, a more restrictive PM emission rate of 0.34 lb/hr is derived from previous air permit. This limit was modeled and determined to protect air quality. Therefore the emission rate of 0.34 lb/hr is established in the renewal. The limit includes both front and back-half particulate.

C. UNBLEACHED KRAFT PULP MILL

The kraft mill consists of the digester system, brown stock washer system, multiple-effect evaporator system, recovery furnaces and smelt dissolving tanks.

a. The requirements of the Pulp and Paper MACT I (subpart S) and the clean condensate alternative (CCA) are placed in the renewal. The collection requirement is 11.0 pounds of HAP per ton of oven-dried pulp (ODP), on a 15-day rolling average. The control requirement is 10.1 pounds of total HAP per ODP or 92 percent destruction of total HAPs from pulp mill condensates.

Prior to April 17, 2006, the facility was required to only collect 7.2 pounds per ODP and remove 6.6 pounds HAP per ODP. The higher collection and control requirements are part of the CCA approved by the department under ch NR 464. The CCA replaces requirements to control HAPs from high volume low concentration (HVLC) vents.

The Department's CCA approval anticipated annual changes in the requirement for HAP collection (10.4 to 11.0 lb/ODP) and control (9.6 to 10.1 lb/ODP), based on the production ratio of the A and B brown stock washers from the preceding year. The company has not offered a formula to calculate these changes. In retrospect, averaging the collection requirement is unduly complicated, and changing the requirements annually is unnecessary. To simplify the renewal averaging is not included. The renewal requires a single minimum collection requirement of 11.0 lb/ODP, and control requirement of 10.1 lb/ODP (or 92% removal).

Recent semi-annual reports indicate the highest expected CCA requirements are met without averaging as shown below.

Table 10. Monthly HAP Collection and Control Rates from MACT Subpart S Sources

Semi – Annual Reports		**Collection** Lb of HAP per ODP 15-day rolling avg.	**Treatment** Lb of HAP Removed per ODP, Daily avg.	**Treatment** HAP Removal Percent
First Half, 2007	**low**	16.90 – Feb	16.02 – April	98.1 % – June
	high	18.12 – May	18.03 – May	98.4 % – Jan, Feb, May
Second Half, 2005	**low**	14.00 – July	13.92 – July	97.4 % – Oct
	high	17.28 – Nov	17.15 – Nov	98.4 % – July

b. Permit 445031180-P01 requires, "The permittee shall operate and maintain pressure monitors and ambient hydrogen sulfide monitors for the NCG collection and incineration system. [s. NR 407.09(4)(a), Wis. Adm. Code]." The requirement is deleted at the request of the company. These sources are located inside the buildings and are monitored in accordance with MACT in the renewal.

c. The renewal includes the LVHC collection system as part of the control device. Thus, the exemption for control devices in NR 464.03(5)(a) may be applied to some releases from the collection system. Vents of LVHC from pressure vacuum breakers and rupture disks in the collection system are now eligible for the one percent exemption, if associated with a startup, shutdown or malfunction. EPA agrees with this interpretation. Formerly all collection system vents were considered violations.

d. S20, P20: EPA alleged in 1988 that the A-line brown stock washer system was reconstructed after September 24, 1976 and was operated in violation of the TRS standards of subpart BB NSPS, codified in s. NR 440.45(4)1, Wis. Adm. Code. The claim was repeated in a 1994 EPA consent agreement. As part of this permit review, EPA reviewed the consent agreement and determined that the A-line was not reconstructed. WDNR agrees with this determination, therefore no conditions to control TRS are placed in the renewal for P20.

e. TRS gases that enter the pulp mill sewer from the digester system are not regulated under s. NR 440.45(4)1 in permit 445031180-P01. Rule applicability was not determined because the mill sewer was not considered a significant source of TRS. In 2004, large quantities of TRS were first reported emitted from the pulp mill sewer. They are exhausted by stacks S28, S29 and S29U. The PTE of these stacks is approximately 40 tons per year of TRS (see Table 6). The smallest portion of the TRS is exhausted at UNOX tank vent S91. One test by the company indicates that the UNOX tank controls (removes) TRS.

As part of this review WDNR asked EPA if the TRS from the digester system is subject to the emission limitation of 5.0 ppm TRS of NR 440.45(4)1 (the NSPS regulation). George Czerniak, Chief of EPA Region V Air Enforcement and Compliance Assurance Branch, issued guidance dated January 3, 2006, which stated the TRS is subject to the NSPS if it originates from the digester system and is not fugitive. The company provided a map which shows specific points of discharge (not fugitive) to the sewer from the digester system. Additional guidance dated May 17, 2007, from Stephen Rothblatt, Director, Air & Radiation Division of EPA Region V, states that the NSPS does not apply to TRS from wastewater condensate streams. Therefore, the renewal does not add the NSPS requirements since TRS from the digester system is emitted from the condensate.

D. PAPER MACHINES

S11, P11 5.0 TPH No. 11 Paper Machine
S13, P13 9.17 TPH No. 13 Paper Machine
S14, P14 5.6 TPH No. 14 Paper Machine
S15, P15 10 TPH No. 15 Paper Machine
S16, P16 11.3 TPH combined capacity No. 10 & 12 Paper Machines

a. Particulate matter emission limits were not included in the original Title V permit. At the time it was written it was assumed that all particulate matter emissions from paper machines were from fuel combustion. Recent stack tests (Stora Enso – Kimberly, WI 2004) show there are particulate matter emissions from the paper formation itself (0.04 lb/ton paper). Therefore emission limits are included in the renewal.

The applicable limit for each paper machine is an emission rate which protects air quality and is lower than the applicable criteria limit, because the particulate matter limits in s. NR 415.05, Wis. Adm. Code would lead to exceedences of particulate matter air quality standards.

The following table lists the maximum emission rate used in modeling, the potential to emit (PTE) calculated, and the applicable criteria limit of each source. The PTE is calculated with the emission factor of 0.04 lb/ton paper and the maximum production rate listed in the application. Criteria limits are generated from either the process weight rate (E) equation, or the exhaust rate of 0.4 lb/1000 lb gas, whichever is more restrictive. The renewal includes the modeled rates as particulate matter emission limits.

Table 11. Particulate Matter Emission Rates from Paper Machines

Paper Machine	Modeled Lb/hr	PTE Lb/hr	Applicable Criteria Limit Lb/hr		
P11	1	2	9.8	$E = 3.59(5.0)^{0.62}$	NR 415.05(2)
P13	1	2	14.2	$E = 3.59(9.17)^{0.62}$	NR 415.05(2)
P14	1	2	44.5	0.4 lb/1000 lb gas	NR 415.05(1)(o)
P15	1	2	15.0	$E= 3.59(10)^{0.62}$	NR 415.05(2)
P16	2	4	56.1	0.4 lb/1000 lb gas	NR 415.05(1)(o)

b. In the original Title V permit, requirements for these paper machines were in four tables. Since the requirements are similar, the renewal groups these paper machines into a single table. Paper machines Nos. 10 and 12 are split off from No. 14, and designated as S16, P16.

c. The renewal includes production limits for these paper machines at the maximum production rates. These limits are set to ensure that particulate matter air quality standards are not exceeded.

d. Visible emission requirements were also not included in the original Title V permit. They have been added. Compliance demonstration, monitoring and recordkeeping requirements are the same as for particulate matter.

E. COMPLIANCE ASSURANCE MONITORING (CAM) RULE

Title 40, Part 64 of the Code of Federal Regulations (CFR) contains Compliance Assurance Monitoring (CAM) requirements. CAM requirements apply to any Pollutant Specific Emissions Unit (PSEU) at a Part 70 source that meets the following criteria:

□ The unit is subject to an emission limitation or standard for a regulated air pollutant. However, the emission limitation is exempt from the criteria per 64.2(b) if it is a limitation from a MACT, or an NSPS standard that was proposed after November 15, 1990. Thus, only "non-exempt" emission limitations may trigger CAM. For example, particulate matter subject to emission limitations from chapter NR 415, Wis. Adm. Code. are non-exempt.

□ The unit uses a control device to achieve compliance with that emission limitation or standard.

□ The unit, by itself, has potential pre-control emissions of the regulated air pollutant that would make it a major source (i.e. greater than 100 tons per year for criteria pollutants; greater than 10 tons per year for individual Federal HAPs).

Are any of the emissions units at this facility subject to CAM requirements? The following table evaluates emissions units with control devices according to the three criteria listed above. Processes that do not have control devices are not included.

Table 12. Applicability of CAM requirements

Stack and Process	Description	Major source (potential before control)?	Subject to Non-exempt Emission limit?	Uses control device to achieve compliance?	Exempt per 64.2(b)?	Subject to CAM?
S07, B07	Bark-fired Power Boiler	PM : Yes S02 : Yes	Yes Yes	Yes No	No No	Yes No
S09, B09 S09, B11	Coal-fired Power Boilers Analysis for each:	PM : Yes S02 : Yes N0x : Yes	Yes Yes No	Yes No No	No Yes (CEM) No	Yes No No
S08, S10 B08, B10	Recovery Boilers Analysis for each:	PM : Yes S02 : Yes CO : Yes TRS: No	Yes Yes No Yes	Yes No No No	No No No No	Yes No No No
S05, P08 S06, P10	Smelt Dissolving Tanks, for each:	PM : Yes	Yes	Yes	No	Yes
S12, P12	Lime Kiln	PM : Yes	Yes	Yes	No	Yes
S19, P19	Slaker	PM : No	Yes	Yes	No	No
S17, P17	Digester System	TRS: Yes TRS: Yes TRS: Yes	Yes Yes No ?	Yes – P12 Yes – B11 Yes – UNOX	Yes (CEM) No No	No Yes No ?

CONCLUSION: Eight PSEU's are in fact subject to CAM.

The CAM rule requires that, if a PSEU's potential to emit, calculated including the effect of

control devices, is greater than the major source level, the facility will monitor CAM parameters 4 times per hour. (40 CFR section 64.3(b)(4)(ii)). Note that this is a different definition of "potential to emit" from the one that applies in other contexts. The major source level is 100 tons per year for particulate matter and for total reduced sulfur compounds (TRS).

Process	PTE including the effect of control devices
B07	268.06 tpy PM (based on emission limit in permit)
B09 and B11	418.73 tpy PM
B08 and B10	216.81 tpy PM
P08	4.46 tpy PM
P10	5.66 tpy PM
P12	13.8 tpy PM
P17	< 100 tpy TRS

CONCLUSION: Boilers B07, B09, B11, B08 and B10 are subject to the requirement to monitor CAM parameters 4 times per hour. The other boilers and processes are not.

Continuous opacity monitors (COMs) are required to monitor opacity from B09 and B11 (one COM) and B08 and B10 (two COMs labeled S08-A and S10-B). Therefore CAM requires that these COMs are used as monitors to ensure that no particulate matter emission limit is exceeded. To provide reasonable assurance of ongoing compliance with the particulate matter emission limitation, 40 CFR 64.3(a)(2) requires that an opacity level is correlated and maintained for each limitation. It is also required that all COMs are certified with the PS1 standard in effect at time of installation.

The facility requests that the existing MACT monitoring fulfill the monitoring requirements of CAM. MACT monitoring is sufficient to meet the requirements of 40 CFR 64.3, when it is demonstrated that the MACT limit is more restrictive than the SIP limit (NR 415.06). Table 13 compares the emission limits for each PSEU. For each PSEU the MACT limitations are equal to or more stringent than the SIP limitations.

Table 13. Comparison of MACT and SIP Emission Limitations

PSEU	Description	Poll-utant	Limit Citation	Emission Limitation	MACT more stringent?	Existing monitoring
B07	Bark-fired Boiler	PM	NR 415.06	0.30 lb/mmbtu, 61.2 lb/hr	No MACT	Δp and Q C02
B09	Coal-fired Boiler	PM	NR 415.06	0.30 lb/mmbtu, 57.7 lb/hr	No MACT	COM S09
B11	Coal-fired Boiler	PM	NR 415.06	0.10 lb/mmbtu, 37.9 lb/hr	No MACT	COM S09
B08 and B10	Kraft Recovery Boilers	PM	Subpart MM NR 415.06	0.07 lb/mmbtu, 0.30 lb/mmbtu , 49.5 lb/hr	Yes	COMs S08, S10
P08 and P10	Smelt Dissolving Tanks	PM	Subpart MM Yes	0.246 lb/ton BLS, 0.30 lb/mmbtu , 10.12 lb/hr	Yes	Δp and Q C05, C10
P12	Lime Kiln	PM	Subpart MM Yes	0.13 gr/dscf @ 10 % 0_2, Same as above, 13.8 lb/hr	Same	Δp and Q C13
P17	Digester System NCG incin. in B11	TRS	Subpart S NR 440.45	Incinerate in a boiler Incinerate in a boiler	Same	Valve open/closed

The department concludes that the planned and existing MACT and Part 70 monitoring in the renewal satisfy the requirements for CAM monitoring. The CAM references to these requirements are added to the renewal in the compliance demonstration sections for particulate matter and TRS.

F. CONDITIONS APPLICABLE TO THE ENTIRE FACILITY

a. **Residual Fuel Oil** Boilers B07, B08, B09, B11 and P12 burn residual fuel oil. Permits 86-SJK-072-R1 (B07, B08, B09, B11) and 86-SJK-024-R1 (P12) cover the sources that burn residual fuel oil. When the maximum permitted residual fuel oil capacity of a facility exceeds 1.5 million gallons per year, sample, analyze and report results as specified under ss. NR 439.085(3)(a) and NR 439.08. The actual residual fuel oil burned in 2004 was 3.4 million gallons. Sampling, analysis and reporting requirements for residual fuel oil are placed in the back of the renewal. References to these requirements are placed in the individual tables.

Lime kiln/B09/B11: Reference test methods for coal and fuel oil sampling and analysis were updated to reflect the current methods listed in NR 439.08, Wis. Adm. Code.

b. All conditions for P34, P58, P74 and P77 are removed because the sources are removed.

c. The exemptions for storage tanks in Renewal Table J. are re-written to reflect the vapor pressure exemption criteria. A footnote is also added to the permit to indicate that the permit language allows the tanks to be exempt from NSPS if any tank is exempt under NR 440.285. The 2003 amendments to the NSPS exempt all the P26 and P27 tanks from NSPS, after adoption of expected revisions to s. NR 440.285, Wis. Adm. Code, expected in early 2008.

SECTION VI. HAZARDOUS AIR POLLUTANTS

In addition to MACT, Wisconsin promulgated state standards for emissions of HAPs under s. 285.27(2)(b), Wis. Stats. These standards are published in Ch. NR 445, Wis. Adm. Code, which addresses about 600 HAPs compared to the 188 HAPs addressed by MACTs. Section 285.27(2)(d), Wis. Stats., limits the application of the state regulations as described below.

> *Emissions regulated under federal law.* Emissions limitations promulgated under par. (b) and related control requirements do not apply to hazardous air contaminants emitted by emissions units, operations, or activities that are regulated by an emission standard promulgated under section 112 of the federal clean air act, including a hazardous air contaminant that is regulated under section 112 of the federal clean air act by virtue of regulation of another substance as a surrogate for the hazardous air contaminant or by virtue of regulation of a species or category of hazardous air contaminants that includes the hazardous air contaminant.

When a MACT does not address all HAP emissions, the emission may be regulated under Chapter NR 445. The applicability of the MACT standards of Part 63, Subparts S, MM, KK, JJJJ and DDDDD, and their interface with Chapter NR 445, is discussed below for each group of sources.

1. POWER BOILERS B07, B09, B11 and B81
HAP emissions from existing boilers B07, B09, B11 and B81 are regulated under chapter NR 445.

2. KRAFT PULP MILL P17, P20, P21, P22, P26
On and after April 16, 2001, all HAP emissions from these existing sources were subject to MACT subpart S. The Pulp and Paper MACT I (subpart S) is a total enclosure standard and uncontrolled emissions are not exhausted. Since there are no emissions to consider NR 445 does not apply. The MACT does not cover the wastewater lagoon, S39, P39. Therefore P39 is subject to NR 445.

3. CHEMICAL RECOVERY UNITS B08, B10, P08, P10 and P12
On and after March 13, 2004, metal HAP emissions from existing sources B08, B10, P08, P10 and P12 were subject to MACT subpart MM. Note: the MACT does not include the slaker and causticizing tanks, S19, P19. Therefore P19 is subject to NR 445.

4. PAPER MACHINES P11, P13, P14, P15, P16
The six paper machines these sources represent are not subject to a MACT. Therefore HAP emissions from these sources are subject to NR 445.

5. PAPER WEB COATING LINES P33, P52
On and after December 5, 2005, all VOHAP emissions from these existing sources were subject to MACT subpart JJJJ. The MACT does not cover inorganic HAPs. Therefore inorganic HAPs are subject to NR 445.

6. PRINTING LINES P55, P56, P59, P72, P76
On and after May 30, 1999, all VOHAP emissions from these sources were subject to MACT subpart KK. The MACT does not cover inorganic HAPs. Therefore inorganic HAPs are subject to NR 445.

HAP emissions that may be subject to NR 445 BACT or LAER control requirements are listed in Table 13. HAPs which are subject to a MACT are shaded; they are not subject to NR 445.

HAP emissions that are subject to MACT are subtracted from the total HAP amount in Table 14

To determine if the remaining HAP emissions are required to be controlled under NR 445, other NR 445-exempt emissions are also subtracted in Table 14.

Boilers that combust group 1 virgin fossil fuels (natural gas, distillate fue oil) are exempt from NR 445. Emissions from the combustion of group 2 virgin fossil fuels (coal and residual fuel oil) are also exempt because all boiler emissions are vented from stacks which have a downwash minimization stack height or other height approved by the Department. NR 445 covers HAP emissions from combustion of all other fuels (petroleum coke, wood waste, paper broke, tire derived fuel and wastewater plant sludge).

It is concluded from Table 14 that:

1. NR 445 BACT control requirements were established for eight HAPs in the original operating permit. Only BACTs for nickel and formaldehyde are required in the renewal, due to changes to NR 445, and the advent of federal MACT standards. The requirements for both BACTs that remain are not changed.

2. BACT to control nickel and arsenic emissions from boilers B08 and B10 has been superceded by MACT limits in the Pulp and Paper II standard. Therefore only BACT for formaldehyde is retained in the renewal.

3. BACT to control nickel and arsenic emissions from boilers B07, B09/B11 will be superseded by the requirements of MACT on 9/13/2007, the chapter NR 462 compliance date. Therefore after 9/13/2007, only BACT for formaldehyde will be retained in the renewal.

4. Acetaldehyde is subject to NR 445 BACT requirements due to the high PTE of acetaldehyde and the 2004 revisions to NR 445. Actual emissions were 5,716 pounds in 2006, which exceeds the NR 445 Table 3 exemption threshold. The HAP is emitted from the paper machines and wastewater treatment system. On April 12, 2006, the facility presented a top-down BACT analysis and proposed that 'to minimize the use of acetaldehyde containing materials' is BACT. The Department agrees with the BACT analysis and proposal. The least cost add-on control option is excessive because it exceeds $ 600,000 per ton acetaldehyde removed. The proposed BACT for the paper machines and wastewater system, with a facility-wide HAP emission cap of 11,929 pounds per year, is promulgated in the renewal.

5. The original permit placed facility-wide caps on NR 445 HAPs that were subject to BACT. On May 22, 2007, the company requested that the HAP caps are removed and stated there could be no emission increase without the caps. The Department agrees, except where the HAP cap is part of BACT. Since the HAP caps for nickel and formaldehyde are part of BACT these caps are retained in the renewal (in Table O.10).

Table 14. Potential-to-Emit For Hazardous Air Pollutants That May Be Subject to NR 445 BACT or LAER (pounds per year)
HAPs that are shaded are subject to a MACT regulation and not NR 445.

Source	Nickel	Arsenic	POM	Formaldehyde	Benzene	Chloroform	1,2 dichloroethane	Carbon Tetrach	Acetaldehyde
B07 S07 = 161‘	5.2	6.4	4.7	902	268.5	20.4	31.1	1.0	1.0
B09 & B11 S09 = 290’	80% Coal 40 20%Coke 417	100% Coal 83.4	100% Coal 0.2	100% Coal 49	100% Coal 265	100% Coal 12	100% Coal 8.1	100% Coal 0	100% Coal 0
B08 S08 = 186’	4.5	0	3.2	70	371	3.3	40.9	37.5	57
B10 S10 = 186’	7.0	0	5.0	109	580	5.1	64.0	58.7	90
P08 S05 = 108’	0.3	0	14.7	477	0.1	0.3	5.6	0	38
P10 S06 = 121’	0.5	0	23.0	747	0.1	0.5	8.7	0	60
P20 S20 = 75’	0	0	0	61	0.2	2.2	0.7	1.3	433
P2l, P22 S22 = 69’	0	0	0	1.5	0.1	48.4	0	6.4	0
P26 S26 = 64’	0	0	0	8.8	2.3	2.5	6.6	30.8	0
P12 S12 = 130’	6.2	0.4	3.1	99	21.7	0.2	0	0	0
P19 S19 = 72’	0	0	0	157.6	6.2	3.9	0.2	0	0
P52 S52 = 42’	0	0	0	75	0	0	0	0	0
P55, P56 S = 35’	0	0	0	90+180	0	0	0	0	0

Source	Nickel	Arsenic	POM	Formaldehyde	Benzene	Chloroform	1,2 dichloroethane	Carbon Tetrach	Acetaldehyde
P59 S59 = 35.1'	0	0	0	232	0	0	0	0	0
B81 S81 = 75'	1.4	0.1	0	50	1.4	0	0	0	0
#11 S11 = 54'	0	0	0	21	0	0	0	0	0
#13 S13 = 57'	0	0	0	385	31	0	0	0	2,650
#14 S14 = 73'	0	0	0	23	0	0	0	0	0
#15 S15 = 69'	0	0	0	420	34	0	0	0	2,890
#10 & #12 S16 = 64'	0	0	0	473	38	0	0	0	3,250
P17 S17 = <40'	0	0	0	0	20.1	2409	0	0	0
#39 S39 = 18'	0	0	0	0	0	0	0	0	2,460
TOTAL	482.1	90.3	53.9	4630.9	1639.7	2507.8	165.9	135.7	11,929

Table 15. Analysis of Hazardous Air Pollutants That Are Subject to NR 445 BACT or LAER.

Source	Nickel	Arsenic	POM	Formaldehyde	Benzene	Chloroform	1,2dichloroethan	Carbon Tetrach.	Acetaldehyde
NR 445 in 445031180-P01	BACT	LAER Variance	BACT	BACT	LAER Variance	BACT	BACT	BACT	None
OLD NR 445 Basis (Lb/yr)	6881.9	2442.7	669.8	10401.0	2969.8	740.3	528.8	148.6	31,760
OLD RISK per Million Persons	0.34	4.6	No Data	7.53	0.055	0.57	0.17	0.53	No Data
PTE HAP - MACT HAP - Non-MACT Virgin Fossil Fuel HAP	482.1 - 18.5 - 41.4	90.3 - 0.5 - 83.4	53.9 - 0.0 - 3.3	4630.9 -648.3 - 198	1639.7 - 22.7 - 288.1	2507.8 -2462.1 - 12.2	165.9 - 7.3 - 8.1	135.7 -38.5 - 0.0	11,929 - 433 - 0.0
NEW NR 445 Basis (Lb/yr)	422.2	6.4	50.6	3784.6	1328.9	33.5	150.5	97.2	11,496
Non-Exempt Potential Emissions Emitted by Stack Height	**≥75'stack** 422.2 **40'-75'** 0	**≥75'stack** 6.4 **40'-75'** 0	**≥75'stack** 50.6 **40'-75'** 0	**≥75'stack** 2305 **40'-75'** 1479.6	**≥75'stack** 1219.7 **40'-75'** 109.2	**≥75'stack** 29.6 **40'-75'** 3.9	**≥75'stack** 150.3 **40'-75'** 0.2	**≥75'stack** 97.2 **40'-75'** 0	**≥75'stack** 246 **40'-75'** 8790 **< 25'** 2,460
Table 3 Exemptions: Emissions Grouped by Stack Height	**≥75'stack** 236 **40'-75'** 66.8	**≥75'stack** 14.2 **40'-75'** 4.04	**≥75'stack** 55.7 **40'-75'** 15.8	**≥75'stack** 4712 **40'-75'** 1337	**≥75'stack** 7854 **40'-75'** 2228	**≥75'stack** 79.2 **40'-75'** 20.6	**≥75'stack** 2356 **40'-75'** 668	**≥75'stack** 4084 **40'-75'** 1159	**≥75'stack** 27,845 **40'-75'** 7,900 **< 25'** 808
Subject to NR 445 BACT in 445031180-P10?	**YES** EXISTING BACT	**NO** REMOVE EXISTING	**NO** REMOVE EXISTING	**YES** EXISTING BACT	**NO** REMOVE EXISTING	**NO** REMOVE EXISTING	**NO** REMOVE EXISTING	**NO** REMOVE EXISTING	**YES** ESTABLISH BACT

SECTION VII. HISTORICAL SUMMARY OF PERMITS AND ORDERS ISSUED TO THE FACILITY

Sources still at the facility are covered by the following permits issued to the facility.

Permit/Order Number	Issuance Date	Description
86-DLJ-058	November 1986	Authorizes venting of TRS gas from 4 digesters, blow tanks, and turpentine condenser systems to the lime kiln for incineration
86-SJK-072	July 1987	Elective Operating Permit (EOP) establishes alternate S02 limits under NR 417.07(5), other limits, fuel-type and monitoring restrictions for B07, B08, B09, B10 and B11. B07 is permitted to burn wood waste, paper broke, residual fuel oil and natural gas. B08 and B10 are permitted to burn Kraft liquor, residual fuel oil and natural gas. B09 and B11 are permitted to burn bituminous coal, paper broke, residual fuel oil and natural gas. B11 is also permitted to burn #2 oil. Coal sulfur content limited to 4.4%. Residual oil content is limited to 2.5%.
86-SJK-072A	January 1991	EOP altered to authorize construction of a 174 foot ESP bypass stack for burning natural gas or residual fuel in B08 and B10, with PM limit of 0.287 Lb/MMBtu.
86-SJK-072B	August 1991	EOP altered to include bituminous coal/petroleum coke blend for B09 and B11, with up to 30% by weight petroleum coke, 275 ppm nickel and 95% ESP removal of nickel, to remain below NR 445, Wis. Adm. Code Table 3B threshold.
86-SJK-072C	November 1992	EOP altered to: 1) authorize construction of ESP bypass stack on B09 and B11 when burning at least 85% natural gas, and boiler startup, and 2) allow burning 13% Tire-derived fuel in B07, 7% TDF in B09, B11 each; and 4 tpd Presto Products polyethylene fuel in B07, B09, B11combined.
86-SJK-072D	June 1993	86-SJK-072C altered to: 1) restrict residual fuel oil use in B07, B08, B10 and P12 combined to 333,333 gallons per month and 25 ppm nickel, and 2) reduced pet. coke weight fraction in B09 and B11 to 25%; to remain below NR 445, Wis. Adm. Code Table 3B threshold.
86-SJK-072-R1	March 1997	Alterations which: 1) replaced limits in permit 86-SJK-072D on residual fuel oil and ESP, with residual oil limits of 266,667 gallons per month and 16 ppm nickel; and, 2) replaced limits in 86-SJK-072B on coal/coke and ESP, with pet. coke limits of 1,583 tons per month and 400 ppm nickel. Alteration also added control device requirements.
86-SJK-024	May 1986	Authorizes use of lime kiln and wet scrubber with continuous monitoring requirements of TRS and oxygen (O_2)and restriction to burn only natural gas (NG).
86-SJK-024A	July 1986	Modification of 86-SJK-024 permit to authorize use of #6 fuel oil in addition to natural gas. To avoid PSD, set a NOx limit to insure NOx increase was less than 40 tons per year.
86-SJK-024B	November 1991	Modification of 86-SJK-024A to authorize discontinuation of monitoring bleed rate from the lime kiln wet scrubber but continue monitoring and recording liquid flow rate, temperature, supply pressure, and pressure drop across scrubber and centrifugal separator

Permit/Order Number	Issuance Date	Description
86-SJK-024C	June 1993	Modification of permits 86-SJK-024B, 86-SJK-072A, 86-SJK-072B to limit source operations to ensure the NR 445 250 pounds of nickel per year limit is not exceeded.
86-SJK-024-R1	March 1997	Modification of 86-SJK-024C and 86-SJK-072D authorizing nickel content, usage, and weight fraction of petroleum coke in B09 and B11; authorizing nickel content and usage of residual fuel oil for B07, B08, B09, B10, and B11; authorizing removal of control efficiency as requirement (unable to demonstrate continual compliance with limitation) the new configuration did not increase the potential amount of emissions of an air contaminant not previously emitted
90-POY-020	February 1991	authorize use of B11 to operate as a back-up combustion system for NCG in order to control TRS emissions from the pulp mill
90-POY-020A	August 1992	modification of 90-POY-020 authorizing a change in SO2 emission limitation for B11 without changing allowable monthly SO2 emission limits (emissions from NCG containing TRS was set to avoid a PSD review and heat input of B11 was included to ensure that there was no overall increase in SO2 emissions)
90-POY-020B	August 1993	modification to 90-POY-020A authorizing B11 to burn TDF and Presto Products polyethylene in addition to other permitted fuels
93-CTS-413	July 1993	Modification authorizes paper coater on #11 paper machine with emission restrictions in order to remain below NR 405, Wis. Adm. Code limits for PSD applicability.
95-POY-098	July 1995	Authorize use of back-up boiler for maintenance and emergency outages with stack dimension requirements, fuel type and hour of operation restrictions
99-SDD-109	September 1999	Construction permit authorizes new collection tanks: T09 - blow heat condenser condensate and T10 – central foul condensate, and establishes requirements for P12, B11, and MACT 40 CFR Part 63, Subpart S affected sources.
03-MHR-010	April, 2003	Authorized construction and initial operation of 10-color flexographic press P72
99-SDD-109-R1	July 2007	A revision to construction permit 99-SDD-109 to correct an error in the emission limit for particulate matter for boiler B11. The boiler was modified in 1999 after installation of LVHC off-gas piping. The modification lowers applicable emission limits to 0.10 pound per million Btu (mmBTU) heat input and 37.9 pounds per hour, per s. NR 415.06(2)(c), Wis. Adm. Code, instead of 0.30 lb per mmBTU.

The following permits, orders, etc. are adopted, under ss. 285.65(3)9, Wis. Stats., NR 406.11(1)(c) and (d), NR 407.09(2)(d) and NR 407.15(3) and (4), Wis. Adm. Code, by Permit #445031180-P10 which then becomes the primary enforceable document:

86-DLJ-058
86-SJK-072
86-SJK-072A
86-SJK-072B
86-SJK-072C
86-SJK-072D
86-SJK-072-R1
86-SJK-024
86-SJK-024A
86-SJK-024B
86-SJK-024C
86-SJK-024-R1
90-POY-020
90-POY-020A
90-POY-020B
93-CTS-413
95-POY-098
99-SDD-109-R1
03-MHR-010

REVIEW OF EQUIPMENT INSTALLED SINCE 1999

This section discusses changes made to the facility since the original operation permit was issued.

None of these changes required a construction permit.
Wax coater and Storage Tank installed December 19, 2000.
No. 76 Flexo Press installed December 19, 2000.
Flexo Plate making system and still (LACT exempt) installed October 4, 2001.
No. 14 Paper Machine Size Press Coater installed in 1969.

SECTION VIII. AMBIENT AIR QUALITY IMPACTS

A. INTRODUCTION

An air dispersion modeling analysis was completed on August 16, 2006 and December 13, 2007 to assess the impact of the particulate matter (PM), sulfur dioxide (SO_2), nitrogen oxide (NO_x), and hydrogen sulfide (H_2S) emissions from Thilmany, LLC in Kaukauna (Outagamie County). This analysis was performed in support of operation permit renewal 445031180-P10.

The facility is located in Outagamie County in an area that is currently attainment/unclassified for all criteria pollutants.

B. MODELING ANALYSIS

- Thilmany supplied the emission parameters used in this analysis for their facility. Jim Crawford verified emissions and rule applicability for the sources. Building dimensions were determined using BPIPPRIME from measurements taken on the plot plans provided with the application. Please refer to the source table.

- Five years (1998-2002) of preprocessed meteorological data was used in this analysis. The surface data was collected in Green Bay, and the upper air meteorological data originated in Green Bay.

- The AERMIC Model (AERMOD) was also used in the analysis. The model used rural dispersion coefficients with the regulatory default options. These allow for calm wind and missing data correction, buoyancy induced dispersion, and building downwash including recirculation cavity effects. Terrain effects were also accounted for, with elevation data derived from digitized USGS data sets.

- Regional background concentrations were found to be as follows:

BACKGROUND CONCENTRATIONS (Concentrations are in $\mu g/m^3$)			
Monitoring Site	Pollutant	Averaging Period	Concentration
Franklin Pump Station Milwaukee County	TSP	24 hour	76.0
Ctr for Gr. Lakes Study Milwaukee County	PM_{10}	24 hour Annual	60.7 26.3
Green Bay East H.S. 1414 East Walnut Brown County	SO_2	3 hour 24 hour Annual	128.3 33.5 7.9
Harrington Beach Park Ozaukee County	NO_x	Annual	13.6
923 270th Avenue Luck, Polk County	CO	1 hour 8 hour	3,188.0 890.4

- The receptors used in this analysis followed USEPA and WDNR ambient air policy and consisted of a rectangular grid with 25-meter resolution along the fence line surrounded by a 50-meter spaced grid extending 500 meters from the facility, surrounded by a 100-meter spaced grid extending 1000 meters from the facility. As per WDNR policy, terrain elevations were included.

C. MODEL RESULTS

The results demonstrate that the ambient air quality standards for TSP, PM_{10}, SO_2, NO_x, and H_2S will be attained and maintained assuming the emission rates and stack parameters listed in the attached source table. Note that to meet the standards, the facility will increase the stack height of S52 to 42 feet above ground. Thilmany will also restrict PM emissions from S52 to 0.60 #/hr, S55 to 0.75 #/hr, S56A and S56B to 0.41 #/hr each (0.82 #/hr total), and S59A and S59B to 0.50 #/hr each (1.00 #/hr total).

Modeling Analysis Results (All Concentrations in $\mu g/m^3$)				
	TSP – 24 hr	PM_{10} – 24 hr	PM_{10} – Annual	NO_x - Annual
Facility Impact	74.0	74.0	17.9	18.5
Background Concentration	76.0	60.7	26.3	13.6
Total Concentration	150.0	134.1	44.2	32.1
NAAQS	150.0	150.0	50.0	100.0
% NAAQS	100.0	89.8	88.4	32.1

Modeling Analysis Results (All Concentrations in $\mu g/m^3$)				
	SO_2 – 3 hr	SO_2 – 24 hr	SO_2 – Annual	H_2S – 24 hr
Facility Impact	505.6	183.4	20.4	61.5
Background Concentration	128.3	33.5	7.9	-
Total Concentration	633.9	216.9	28.3	61.5
NAAQS (or AAC)	1,300.0	365.0	80.0	335.0
% NAAQS (or AAC)	48.8	59.4	35.4	18.4

D. CONCLUSION

The results of the modeling analysis demonstrate that the applicable air quality standards will be satisfied assuming the emissions rates and stack parameters listed in the source table. Note that to meet the standards, the facility will increase the stack height of S52 to 42 feet above ground. The facility will also restrict PM emissions from S52 to 0.60 #/hr, S55 to 0.75 #/hr, S56A and S56B to 0.41 #/hr each (0.82 #/hr total), and S59A and S59B to 0.50 #/hr each (1.00 #/hr total).

THILMANY (INTERNATIONAL PAPER) – KAUKAUNA Stack Parameters					
ID	LOCATION (UTM)	HEIGHT (M)	DIAMETER (M)	VELOCITY (M/S)	TEMP (K)
S07	399990, 4903827	49.07	1.68	19.24	346.9
S09	400044, 4903789	88.39	2.59	19.69	444.7
S08	399950, 4903812	56.69	1.98	13.78	477.4
S10	399953, 4903809	56.69	1.83	16.17	477.4
S05	399987, 4903851	32.92	0.71	10.60	345.2
S06	399975, 4903846	36.88	1.22	9.30	345.8
S12	399939, 4903917	39.62	1.19	8.50	338.6
S19	399878, 4903862	21.95	0.48	2.50	363.6
S52	400213, 4903950	12.80	0.29	20.44	310.8
S55	400179, 4903943	10.67	0.78	7.01	324.7
S56A	400187, 4903921	10.97	0.62	12.13	310.8
S56B	400197, 4903929	10.82	0.62	12.13	310.8
S59A	400158, 4903961	10.80	0.34	17.37	316.3
S59B	400172, 4903973	10.70	0.34	17.37	316.3
S11	400146, 4903842	16.46	1.01	24.00	320.8
S13	400162, 4903828	17.37	0.97	17.79	321.9
S14	400177, 4903811	22.25	1.34	9.07	321.9
S15	400191, 4903793	21.03	1.49	12.96	324.7
S16	400140, 4903850	19.51	1.31	11.97	321.9
S81	399990, 4903838	22.86	1.22	14.34	530.8
S72	400181, 4904012	10.06	0.63	10.57	348.0
S74	400137, 4903976	10.06	0.58	6.27	355.0
S76	400125, 4903976	10.67	0.69	6.33	321.9
S20	400005, 4903878	22.86	0.88	20.77	338.6
S22	400032, 4903855	21.03	0.61	8.09	310.8
S26	399957, 4903859	19.51	0.37	3.14	338.6
S39	400346, 4903870	5.49	0.41	22.69	314.7
S25	400001, 4903889	24.38	0.61	7.33	335.8
S27	400005, 4903954	31.70	0.41	10.60	296.9
S28	400414, 4903058	3.66	0.10	5.35	305.2
Lagoon1	400496, 4903977	0.00	Circular Area Source Radius = 72.0 m		
Lagoon1A	400419, 4903875	0.00	Circular Area Source Radius = 55.0 m		

Notes:

- Boiler 8 and Boiler 10 both vent out S08 and S10. Maximum short-term impacts will occur with all emissions from S08, due to the lower exit velocity.

- The paper machines vent from multiple stacks that comprise S11, S13, S14, S15, & S16. Due to the low relative emissions and the distance from the stacks to the closest receptor, a representative stack was used for each paper machine.

THILMANY – KAUKAUNA Emission Rates				
ID	PM RATE (#/HR)	SO_2 RATE (#/HR)	NO_x RATE (#/HR)	H_2S RATE (#/HR)
S07	61.20	92.70	36.50	-
S09	95.60	3,865.4	536.00	-
S08	49.50	466.30	62.00	5.70
S10	See S08	See S08	62.00	5.70
S05	4.46	-	-	0.093
S06	5.66	-	-	0.15
S12	13.80	8.71	8.90	0.45
S19	0.34	-	-	0.018
S52	0.60	-	-	-
S55	0.75	-	1.10	-
S56A	0.41	-	0.55	-
S56B	0.41	-	0.55	-
S59A	0.50	-	0.70	-
S59B	0.50	-	0.70	-
S11	1.00	-	-	-
S13	1.00	-	0.30	-
S14	1.00	-	4.80	-
S15	1.00	-	0.30	-
S16	2.00	-	-	-
S81	0.73	-	11.60	-
S72	-	-	0.60	-
S74	-	-	0.20	-
S76	-	-	0.90	-
S20	-	-	-	0.013
S22	-	-	-	0.17
S26	-	-	-	0.31
S39 *	-	-	-	0.22
S28 (S25)	-	-	-	0.24
S29 (S27)	-	-	-	2.24
S91 (S28)	-	-	-	0.0004
Lagoon1	-	-	-	0.14
Lagoon1A	-	-	-	0.08

Notes:

* Stack S39 represents the lagoon lift station (lagoon entrance).

In the above table, (S25) is a second stack id # proposed by the facility for the same stack, the second id # is used in modeling and on the air inventory.

SECTION IX. INSIGNIFICANT EMISSION UNITS

(The facility has calculation documentation showing that the emissions are less than the NR 407, Wis. Adm. Code Table 2 levels.)
Maintenance of Grounds, Equipment, and Buildings
Fuel Oil Storage Tanks (< 10,000 gal)
Demin and Oxy Scavenging of Water for Boilers
Purging of Natural Gas Lines
Boiler, Turbine, and HVAC System Maintenance
Pollution Control Equipment Maintenance
Int Comb Eng Used for Warehouse and Mat Trans
Fire Control Equipment
Janitorial Services
Office Activities
Convenience Water Heating
Convenience Space Heating (< 5 mil BTU/hr)
Emergency Generators
Cooling Towers
Chillers
No. 6 Fuel Oil Tank
Hog Fuel Handling System
Coal Crusher & Conveying System
Dry Ash Conveying & Storage System (baghouse)
Secondary Fiber Supply System
Salt Cake Unloading System
Lime Unloading, Handling & Storage System
Salt Cake Mix Tank When Exhausted to Atmosphere
Black Liquor Dust Tank Exhaust
Pilot Digester
Coating Kitchen: Aqueous Ammonia Storage & Exhaust Starch Unloading System
10/12 Color Rooms-Exhaust Hood
Stock Prep-Starch & Clay Unloading & Mixing
No. 15 Paper Machine Roll Grinder
Clay Coating Boilout
Paper Machine Wire Repair
Paper Conveying System
Decorating Dept. Sources:
  Vulcanizing exhaust
  Plate room rubber solvent exhaust
  Barrel washer exhaust
  Ink room exhaust
  Ink washup area
Poly Dept. extruder roll cleaning
Poly die burn off oven
Causticizing system grouping (units after the smelt tanks to the Lime kiln not including the slaker). Water treatment plant (incoming process water)
Sawdust cyclone at box factory
Laboratories, upper and lower mills

SECTION X. SOURCE COMPLIANCE STATUS

The Department finds that:

1. The source will not cause nor exacerbate a violation of an ambient air quality standard or ambient air increment.

2. The source will meet applicable emission limits and other requirements, with the exception of the particulate matter limit of 0.10 pounds per MMBtu heat input for boiler B11.

3. Section 285.64, Wis. Stats., sets forth criteria for the approval of operation permits for stationary sources which are not in compliance with applicable emission limits and other requirements. Since the Department finds that the stationary source does not comply with the applicable requirements, the operation permit will include all of the following:

(a) A compliance schedule that sets forth a series of remedial measures that the owner or operator of the existing source must take to comply with the requirements which the stationary source is violating.

(b) A requirement that, at least once every 6 months, the owner or operator of the existing source submit reports to the Department concerning the progress in meeting the compliance schedule and the requirements which the stationary source is violating.

4. In order to satisfy the requirements of item 3. above, a 36-month compliance plan and reporting requirements are included in the renewal. The facility must complete the following actions by the months from issuance of the renewal:

(a) Complete engineering evaluation of control options within 6 months.

(b) Selection of control option within 3 months of item a.

(c) Complete engineering and design of new control equipment within 9 months of item b.

(d) Complete construction of new control equipment 9 months from item c.

(e) Complete shakedown of new control equipment and commence normal operation 3 months from item d.

(f) Conduct stack test to demonstrate compliance with 0.1 lb/MMBtu heat input 3 months from item e.

SECTION XI. PRELIMINARY DETERMINATION

The Wisconsin Department of Natural Resources has reviewed the permit application and other materials submitted by Thilmany, LLC, and hereby makes a preliminary determination that an operation permit may be issued with the following Draft Applicable Limits and Draft Permit Conditions.